

ANNUAL RISE OF COLUMBIA RIVER.

[From report of Mr. R. C. Mize, meteorologist, Portland, Oreg.]

At the close of March the following forecast was made: "With normal temperature prevailing during the remainder of the spring, the maximum stage of water at Portland during the annual rise of the Columbia should be about 20 feet."

Temperature averaged slightly above normal during April and May, permitting ample run-off during those months and causing a very moderate flood, with a crest stage at Portland of 19.8 feet on June 16, or 0.5 foot below the 46-year average, and only 0.2 foot below the stage forecast in March.

Reports from 197 interested parties showed losses of \$46,739 and saving of property by warnings of \$76,020. The largest single item of loss was due to suspension of business. Losses of prospective crops amounted to \$8,088. All dikes held.

There was the usual number of destructive overflows of small streams, due to local torrential rains, and a great amount of damage was done to roads, bridges, crops, etc. The most severe of these floods occurred on July 15 and 16 in eastern Colorado and in central, eastern, and north-eastern Wyoming from July 22 to 27, inclusive. Losses in Colorado were unreported, but those in Wyoming, according to estimates obtained by Mr. George W. Pitman, meteorologist in charge of the Weather Bureau office at Cheyenne, Wyo., were about \$775,000, of which \$300,000 was in land and growing crops and as much to railroads. Other severe local floods occurred on July 8 in Bristol, Tenn., and Bristol, Va., and adjacent sections, and on July 30 in the Patapsco Valley of Maryland, Pennsylvania generally, and southeastern Virginia. The damage done amounted to perhaps \$1,000,000, of which more than one-half was in Maryland and about one-fourth in Virginia.

The Patapsco River flood was the greatest since the flood of July 24, 1868, when the river at Ellicott City, Md., rose 5 feet in 10 minutes. Thirty-five persons were drowned, and the losses amounted to about \$1,000,000.

WATER LEVEL OF GREAT SALT LAKE, UTAH.

After having reached its highest level since 1889, the waters of Great Salt Lake began to fall during July. During the month of June the peak stage of 8 feet above the zero of the gage prevailed, but by July 15 the water had risen to 7.6 feet, with a further slow decline indicated.

Flood stages during July, 1923.

River.	Station.	Flood stage.	Above flood stages—dates.		Crest.	
			From—	To—	Stage.	Date.
EAST GULF DRAINAGE.						
West Pearl.....	Pearl River, La.....	<i>Feet.</i> 13	25	28	<i>Feet.</i> 14.2	26
MISSISSIPPI DRAINAGE.						
Arkansas.....	Fueblo, Colo.....	10	12	12	11.4	12
Neosho.....	Neosho Rapids, Kans.	22	6	6	23.3	6
Yazoo.....	Yazoo City, Miss.	25	(1)	4	25.8	1
Missouri.....	Waverly, Mo.....	23	7	8	23.3	7
Grand.....	Chillicothe, Mo.....	18	6	6	18.4	6
Do.....	Brunswick, Mo.....	10	(1)	10	12.7	7
COLORADO DRAINAGE.						
Colorado.....	Lees Ferry, Ariz.....	12	(1)	17	13.9	1
Do.....	Parker, Ariz.....	7	(1)	(2)	9.2	16
COLUMBIA BASIN DRAINAGE.						
Columbia.....	Marcus, Wash.....	24	(1)	17	28.1	1
Do.....	Vancouver, Wash.....	15	(1)	12	18.8	1
Willamette.....	Portland, Oreg.....	15	(1)	11	18.0	1

¹ Continued from June.² Continued into August.

MEAN LAKE LEVELS DURING JULY, 1923.

By UNITED STATES LAKE SURVEY.

[Detroit, Mich., Aug. 4, 1923.]

The following data are reported in the "Notice to Mariners" of the above date:

Data.	Lakes. ¹			
	Superior.	Michigan and Huron.	Erie.	Ontario.
Mean level during July, 1923:				
Above mean sea level at New York.....	Feet. 601.87	Feet. 579.89	Feet. 572.04	Feet. 245.90
Above or below—				
Mean stage of June, 1923.....	+0.20	+0.03	+0.02	—0.13
Mean stage of July, 1922.....	—0.57	—0.79	—0.70	—1.12
Average stage for July, last 10 years.....	—0.77	—1.16	—0.93	—1.07
Highest recorded July stage.....	—1.95	—3.69	—2.37	—2.92
Lowest recorded July stage.....	+0.39	—0.01	+0.53	+1.21
Average relation of the July level to—				
June level.....		+0.10	0.00	0.00
August level.....		+0.10	+0.20	+0.30

¹ Lake St. Clair level: In July, 574.37 feet.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, JULY, 1923.

By J. B. KINCER, Meteorologist.

Exceptionally favorable weather prevailed for harvesting winter wheat during the first 10 days of July throughout the interior of the country, except for some interruption by rain in the upper Ohio Valley States. Warm weather in the spring wheat region, however, was rather unfavorable for that crop, but was favorable for corn in most of the principal producing areas. Beneficial rains fell during this period in the middle Atlantic coast area, and there was less rainfall in much of the Southeast, which was of benefit to staple crops.

Cotton made fair to very good progress in the central and eastern portions of the belt, though it was becoming too dry in some western cotton-growing districts. Exceptionally favorable weather continued in the more north-western States where further substantial rains were received.

The second decade of the month had mostly favorable weather for agricultural interests in much the greater part of the country. Copious rains about the middle of the month largely relieved droughty conditions in the Northeastern States, while increased moisture benefited vegetation in the middle Atlantic area, though many localities continued too dry, particularly in Pennsylvania.

Threshing progressed in the southern portion of the Winter Wheat Belt with no material interruption, except in parts of Kansas where there was some delay by rain and some damage to wheat in shock. During this period excellent weather for the rapid growth of corn was the rule, except where it was too dry in the southern Great Plains. It was too warm, however, for the best development of spring wheat, but cotton showed general improvement in much of the belt, though that planted late needed rain rather badly in some western localities. The best showers of the season, so far, occurred in the grazing area of the far Southwest where long drought had prevailed, although the range continued too dry in some sections.

By the latter part of the month the drought had been intensified by continued absence of rain from central Kansas southward, and most crops showed deterioration, especially corn. Rain was badly needed also in parts of Iowa, Illinois, Kentucky, and Arkansas, but much-needed

part of the month, it being too dry in the western portion of the belt and too cloudy and wet in most of the central and eastern portions, though more favorable in the northeast. Exceptionally favorable weather continued for ranges and stock in the northwestern grazing districts, especially in Montana.

CONDENSED CLIMATOLOGICAL SUMMARY.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, July, 1923.

Section.	Temperature.								Precipitation.							
	Section average.	Departure from the normal.	Monthly extremes.						Section average.	Departure from the normal.	Greatest monthly.		Least monthly.			
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.		
	° F.	° F.		° F.				° F.		In.	In.		In.	In.		
Alabama	78.5	-1.4	Madison	101	12	Maple Grove	48	1	5.23	-0.59	Marion	11.04	Evergreen	1.28		
Arizona	79.9	-0.2	2 stations	116	* 1	Henry's Camp	38	7	2.92	+0.28	San Rafael Ranch	8.41	Supai	T.		
Arkansas	79.9	0.0	Hope	105	24	Rogers	43	1	3.53	-0.39	Little Rock	7.86	Harrison	0.33		
California	71.4	-1.8	Greenland Ranch	123	29	Portola	29	18	0.05	-0.03	Campo	1.35	148 stations	0.00		
Colorado	67.5	+1.0	Lamar	106	31	Longs Peak	24	20	3.18	+0.86	Silver Lake	11.50	Garnett	0.34		
Florida	80.4	-0.7	New Smyrna	100	17	Cottage Hill	60	20	6.97	-0.19	Ocala	12.80	Sand Key	1.10		
Georgia	78.8	-1.3	Dublin	105	13	Blue Ridge	48	7	4.40	-1.37	Thomasville	10.59	Newman	0.52		
Hawaii	74.1	+0.1	Waianae	92	22	5 stations	53	* 1	5.40	-1.02	Puu Kukui (upper)	32.00	6 stations	0.00		
Idaho	69.7	+2.0	Weiser	110	* 23	Stanley	26	4	0.93	+0.19	Bogus Creek	2.53	American Falls	0.02		
Illinois	77.1	+1.2	Carbondale	107	24	Mount Carroll	47	1	2.15	-1.29	Freeport	7.05	Henry	0.05		
Indiana	75.2	-0.1	Veedsburg	100	21	2 stations	41	1	3.51	-0.28	Frankfort	9.46	Terre Haute	0.59		
Iowa	76.5	+2.4	Nora Springs	102	22	Little Sioux	47	28	1.75	-2.21	Mount Ayr	5.54	2 stations	0.29		
Kansas	78.7	+0.3	Fredonia	111	24	Hoxie	49	29	3.15	-0.31	McFarland	10.12	Beaver	0.21		
Kentucky	76.8	+0.1	3 stations	99	* 12	Eubank	44	1	3.59	-0.71	Anchorage	7.79	Marion	0.14		
Louisiana	80.2	-1.4	Plain Dealing	106	25	Farmerville	67	1	6.98	+0.56	Schriever	15.15	Robeline	1.68		
Maryland-Delaware	73.9	-1.3	Boysd, Md.	101	* 20	Freeland, Md.	39	1	4.61	+0.27	Millsboro, Del.	8.87	Chesapeake City, Md	1.98		
Michigan	68.6	+0.1	3 stations	98	* 10	Humboldt	35	4	3.20	+0.25	Ironwood	10.71	Ludington	0.51		
Minnesota	72.9	+3.6	International Falls	103	22	Itasca State Park	36	1	2.82	-0.77	Two Harbors	7.58	Winnebago	0.71		
Mississippi	79.4	-1.4	Yazoo City	102	25	2 stations	54	1	5.80	+0.55	Pearlington	12.08	University	2.25		
Missouri	78.2	+0.7	2 stations	105	24	Clinton	50	* 1	3.07	-0.89	Waverly	10.29	Tarkio	0.24		
Montana	69.2	+3.5	Knowlton	107	19	Wisdom	25	28	2.34	+0.75	Wheaton	7.42	Pleasant Valley	0.00		
Nebraska	76.5	+1.9	Holdrege	104	10	2 stations	45	* 1	2.83	-0.59	Bingham	8.61	Stanton	0.36		
Nevada	73.9	+1.1	Pahrump	116	28	Rye Patch	24	7	0.42	+0.09	Searchlight	2.52	7 stations	0.00		
New England	65.9	-2.6	Norwalk, Conn.	99	* 20	Chelsea, Vt.	31	1	3.14	-0.58	Bennington, Vt.	5.68	New Haven, Conn.	1.49		
New Jersey	71.9	-1.9	Burlington	102	21	Charlotteburg	40	1	3.88	-0.68	Newark	6.28	Woodcliffe Lake	0.93		
New Mexico	72.7	+0.8	Orogrande	110	1	Elizabethtown	34	3	2.00	-0.70	Cloudercroft	5.90	Cundiyo	0.05		
New York	67.8	-1.8	Searsdale	104	21	Indian Lake	32	7	2.84	-1.08	Andover	5.33	Lowville	0.58		
North Carolina	75.6	-0.5	Scanlon	101	21	Mount Mitchell	42	18	5.93	-0.63	Swansboro	14.40	Tryon	1.15		
North Dakota	71.2	+3.7	Pembina	103	9	Turtle Lake	35	30	3.14	+0.53	Washburn	6.16	Langdon	0.70		
Ohio	72.7	-0.6	Lancaster	100	11	Canfield	41	23	3.57	-0.21	Toboso	11.34	Hamilton	1.21		
Oklahoma	83.2	+2.3	Okeene	111	31	Goodwell	55	2	1.10	-1.82	Hurley	5.83	4 stations	T.		
Oregon	67.3	+0.9	2 stations	106	13	La Pine	27	31	1.18	+0.59	Welches	3.94	2 stations	0.04		
Pennsylvania	71.0	-1.0	Gettysburg	100	* 20	West Bingham	32	23	4.24	-0.09	Vandegrift	9.98	Ansonia	0.92		
Porto Rico	78.5	-0.3	Lares	97	11	4 stations	58	* 3	4.49	-2.16	Maricao	18.50	Santa Rita	1.28		
South Carolina	79.0	-0.8	Society Hill	104	5	3 stations	57	* 1	4.50	-1.44	Georgetown	8.88	Calhoun Falls	1.15		
South Dakota	74.6	+3.6	Dupree	105	18	Lead	40	29	3.45	+0.15	Deadwood	9.30	Admore	0.61		
Tennessee	77.2	-0.3	2 stations	101	* 8	Pinewood	43	1	3.99	-0.68	Charleston	7.82	Pinewood	0.98		
Texas	83.5	+0.6	Hemmetta	114	* 15	Seminole	50	12	1.67	-1.06	Bon Weir	8.90	6 stations	0.00		
Utah	72.7	+1.6	2 stations	110	* 29	3 stations	37	* 1	1.19	+0.23	Mammoth Ranger Station	3.80	3 stations	T.		
Virginia	74.3	-1.1	Lincoln	100	* 20	Burkes Garden	44	* 3	5.12	+0.11	Mayhurst	11.14	Dale Enterprise	2.49		
Washington	67.6	+1.4	Trinidad	109	* 22	Paradise Inn	32	* 3	1.17	+0.46	Kettle Falls	2.63	Wahluke	0.00		
West Virginia	71.7	-1.2	Inwood	100	20	Cheat Bridge	37	1	4.70	+0.12	Elizabeth	9.46	Powellton	2.22		
Wisconsin	71.3	+2.0	2 stations	100	* 9	Hayward	36	1	3.24	-0.53	High Falls	7.89	La Crosse	0.63		
Wyoming	68.3	+2.7	Basin	103	20	Snake River	27	4	2.46	+1.06	Sheridan	6.37	Eden	0.00		

¹ For description of tables and charts, see REVIEW.
² Other dates also.